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TISBE MONOZOTA, A NEW HARPACTICOID COPEPOD
FROM FLORIDA

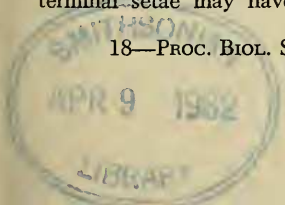
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The new species of *Tisbe* described herein was obtained during February-May 1961 from a salt water aquarium in the Division of Marine Invertebrates, Smithsonian Institution. The aquarium contained sea water collected 5 October 1960, by F. M. Bayer in Bear Cut, between Virginia Key and Biscayne Key, Biscayne Bay, Dade County, Florida. A few rocks, collected at the same locality, were placed in the aquarium, and it is not known whether the specimens of *Tisbe* were introduced with the water or with the rocks.

Tisbe monozota, new species
Figs. 1-23

Female: Body colorless with red eye. Length, excluding caudal setae, 0.83-0.94 mm. Prosome about 1.7 times as long as broad, about 2.2 times as long as urosome. Genital segment divided by minutely serrate dorsal suture which becomes smooth and continues laterad for about half the depth of the segment, turns anteriorad and runs nearly to anterior margin of segment, then turns dorsad and ends. Posterior lateral margins of prosomal, genital, and third urosomal segments each bearing a minute slender seta; cephalothorax with additional pair of lateral setae at level of leg 1. Rostum broadly rounded, with 2 sensory filaments. Posterior margins (dorsal, ventral, and lateral) of all urosomal segments except fifth pedigerous segment minutely serrate. Anal operculum with smooth margin.

Caudal ramus a little shorter than width at base, distolateral corner produced into truncate lobe bearing outermost of 4 terminal setae. Next-to-innermost terminal seta much the longest and heaviest, about 0.9 as long as body, proximal 0.25 with smooth margins, next 0.30 armed with barbs gradually decreasing in size distally, distal 0.45 unarmed. Next-to-outermost terminal seta about 0.5 as long as next-to-innermost seta, proximal 0.27 with smooth margins, next 0.31 armed with barbs gradually decreasing in size distally, distal 0.41 unarmed. Either of 2 large terminal setae may have "telescoped" joint on basal unarmed section



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(Figs. 6-7); when present, this joint occurs on corresponding setae of both right and left rami. Outer and inner terminal setae subequal; outer seta with bend near base. Dorsal and ventral setae somewhat variable. Dorsal setae comprise 2 long slender setae, one proximal to distolateral lobe of ramus, its origin varying from medial to lobe to almost on lateral margin of ramus; the other proximal to interval between bases of 2 long terminal setae; and 1-3 short spiniform setae in a row medial to medial long dorsal seta. One ventral seta inserted near lateral margin in distal half of ramus. Lateral seta inserted at about middle of lateral margin, sometimes absent. All setae naked except 2 large terminal setae.

Antenna 1 (Fig. 10) 8-segmented; segment 1 a little more than half as long as segment 2, segments 3 and 4 subequal, about 0.8 as long as segment 2; anterior margin of segment 1 armed with numerous short fine setae; aesthetask on segment 4 about 0.75 as long as entire appendage; segment 6 bearing a spiniform seta. Antenna 2 (Fig. 12) of usual form for genus; basipod with several surface spinules. Gnathal lobe of mandible with 6 teeth. Maxilla 1 (Fig. 9) and 2 (Fig. 14) of usual form for genus. Maxilliped (Fig. 15) with row of spines along inner margin of segment 3.

Exopod of leg 1 shorter than endopod, segment 2 about as long as segment 1. Segment 3 about a third as long as segment 2. Lateral seta of segment 2, and 4 proximal setae of segment 3 without the usual tuft-like comb of setules at the apex, but with a single prominent setule (Figs. 17-18). Segment 2 of endopod longer than segment 1.

Legs 2-4 (Figs. 19-22) typical for genus. Armature of setae and spines identical with summaries given by Lang (1948: 364, Table 7) and by Humes (1954: Table 4).

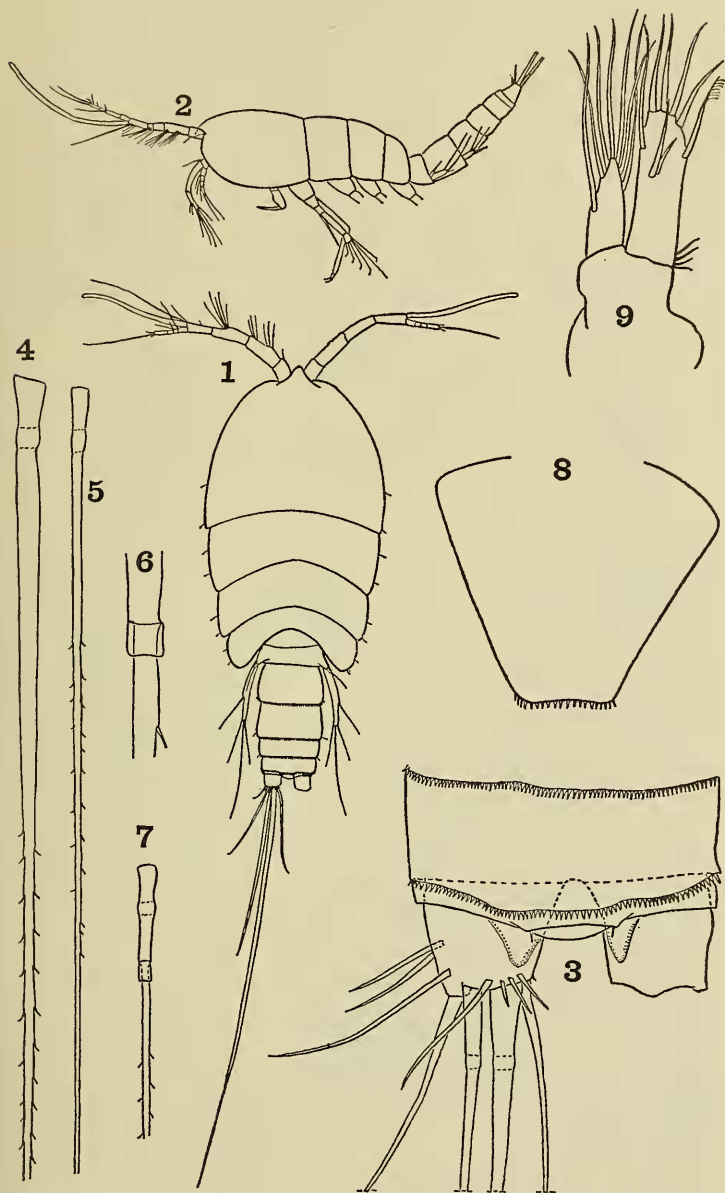
Leg 5 (Fig. 23) reaching nearly to posterior margin of genital segment. Inner lobe of proximal segment bearing 3 setae, middle one longest; outer lobe with 1 seta. Distal segment about 6 times as long as wide; next-to-innermost of 4 terminal setae the longest, most lateral terminal seta very short; lateral seta well removed (about one-third length of segment) from distal end; margins of segment rather sparsely armed with setules; anterior surface with scattered setules. Leg 6 absent.

Male: Color and body form similar to that of female, but prosome narrower, about twice as long as broad, about 1.5 times as long as urosome. Body length 0.70-0.76 mm. Posterior margins of urosome segments minutely serrate as in female. Caudal ramus as in female.

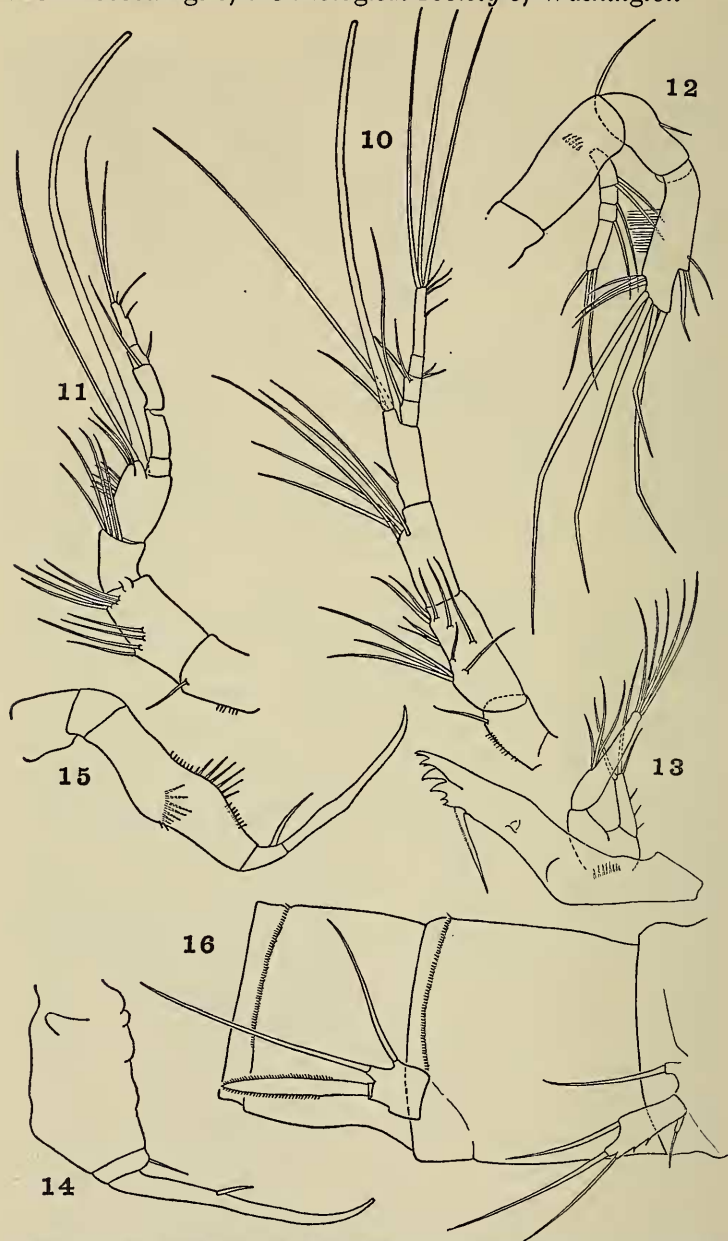
Antenna 1 (Fig. 11) prehensile, 8-segmented, "knee" between segments 6 and 7; terminal segment sometimes having additional faint suture; aesthetask on segment 4 about as long as entire appendage. Mouthparts as in female.

Legs 1-4 as in female, except that inner seta of segment 1 of endopod of leg 2 is modified into strong spine (Fig. 20).

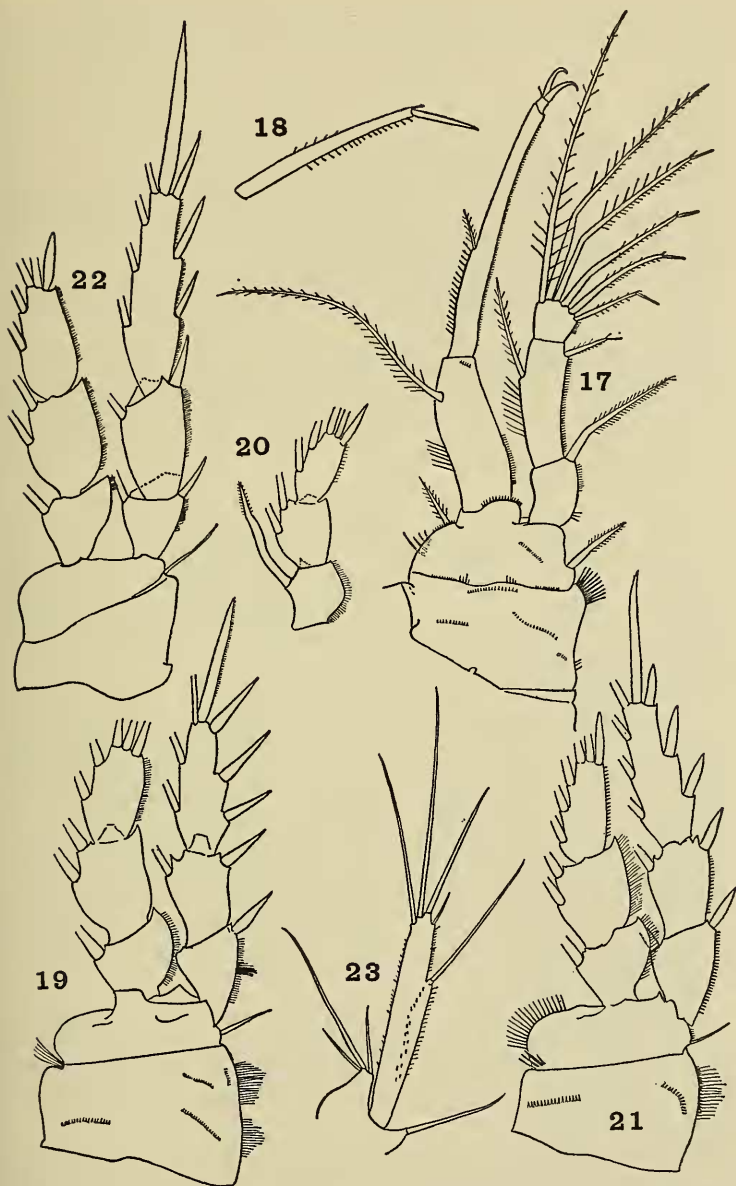
Leg 5 (Fig. 16) shorter than in female. Proximal segment with 1 seta on inner lobe and 1 on outer lobe. Distal segment about 0.25 as



FIGS. 1-9. *Tisbe monozota*, new species. 1.—Female, dorsal. 2.—Male, lateral. 3-9.—Female. 3.—Last urosome segment and caudal rami. 4.—Next-to-innermost caudal seta. 5.—Next-to-outermost caudal seta. 6-7.—Next-to-outermost caudal setae from two other females, showing telescoped joints. 8.—Labrum. 9.—Maxilla 1.



FIGS. 10-16. *Tisbe monozota*, new species. 10.—Antenna 1, ♀. 11.—Antenna 1, ♂. 12.—Antenna 2, ♀. 13.—Mandible, ♀. 14.—Maxilla 2, ♀. 15.—Maxilliped, ♀. 16.—First 3 segments of abdomen, ♂, showing legs 5-6.



FIGS. 17-23. *Tisbe monozota*, new species. 17.—Leg 1, ♀. 18.—Proximal outer seta of exopod segment 3, leg 1, ♀. 19.—Leg 2, ♀. 20.—Leg 2, endopod, ♂. 21.—Leg 3, ♀. 22.—Leg 4, ♀. 23.—Leg 5, ♀.

long as that of female, about 5 times as long as broad; medial of 2 terminal setae the longer; lateral margin with long seta well removed (about 0.25 length of segment) from distal end; medial margin with 2 spinules.

Leg 6 unisegmental, about as long as width at base. Inner terminal seta broad, spinose; outer terminal seta slender, naked, about a third longer. Lateral margin with 1 slender seta.

Types: Male holotype, USNM 107152; female allotype, USNM 107153; and 37 ♀, 29 ♂, 136 copepodid paratypes, from aquarium water collected in Bear Cut, Biscayne Bay, Florida.

The specific name, "monozota," derived from the Greek "mono," single, and "ozotos," branched, refers to the single apical setule on the setae of exopod segment 3 of leg 1.

Remarks: (Full references to all species cited in the following discussion are given by Lang (1948), except for 2 species described by Humes (1957). References to original descriptions are therefore omitted from the bibliography). Three characters distinguish *T. monozota* from all other species of *Tisbe*:

1. Only in *T. monozota* is there a single setule at the distal end of the setae of exopod segment 3 of leg 1. In other species of *Tisbe* these setae bear a group of setules. The setules of this group may be compact and tuftlike as in *T. furcata* (Baird), well spaced as in *T. gurneyi* (Lang), or absent as in *T. racovitzai* (Giesbrecht). According to Johnson and Olson (1948), the characteristic arrangement of setules is present in all copepodid stages of *T. furcata*; the same is true of the distinguishing single setule in *T. monozota*.

2. Sexual dimorphism in leg 2 has been reported in only 3 species: *T. gracilis* (T. Scott), *T. holothuriae* Humes (1957), and *T. cucumariae* Humes (1957). In these species, as in *T. monozota*, the seta of endopod segment 1 is transformed into a strong spine, differing in structure in the 4 species. In *T. gracilis* it is bifurcate at the apex and plumose in the distal 0.6. In *T. holothuriae* it is plumose throughout its length, slightly truncate apically, and with peculiar surface striations on the distal half. In *T. cucumariae* the spine is slightly sinuate, pointed and recurved apically, and plumose throughout its length. The spine in *T. monozota* is slightly sinuate, pointed apically, and has short marginal setules in the distal 0.3.

Unfortunately the male has been described in only a few species of *Tisbe*, and in at least one of these species, *T. wilsoni* Seiwell (1928), the sexual dimorphism in leg 2 has been overlooked. Leg 2 of the male holotype of *T. wilsoni*, which I have examined, closely resembles that of the male *T. gracilis*.

3. In the distal segment of female leg 5, the length to breadth ratio and position of the lateral seta are distinctive. Of the species having a length to breadth ratio of about 5:1 or more, only in *T. elegantula* (Sars) and *T. gurneyi* (Lang) is the lateral seta as much as 0.25 the length of the segment from the distal end. The latter two species can

easily be distinguished from *T. monozota* by the comparative lengths of segments 1-4 of antenna 1 and by the tufted setae of the third exopodal segment of leg 1.

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